Comparative Review of Time-Resolved Gamma Survey Data Along the Preston New Road Corridor

February and July 2026 citizen field measurements - preliminary technical note for regulatory review

Summary

This note reviews native RadiaCode-103 data from fixed and moving measurements along the Preston New Road corridor. The review combines 13 accumulated XML spectra, seven GPS count-rate tracks and two master time-resolved spectrogram files. The same detector (serial RC-103-010950) and the same energy calibration were used throughout.

The February elevated-verge point and the July access-cover point are different locations. The evidence therefore does not demonstrate persistence of one hotspot through time. It documents sustained local count-rate variation at two separate points, with additional moving-track data providing contextual evidence of wider spatial variability.

In February, the principal near-surface accumulation averaged 9.13 counts per second (CPS), compared with 4.36 CPS at a nearby duration-matched baseline. A raised comparison at the same immediate point averaged 6.35 CPS. In July, the access cover averaged 6.09 CPS near the surface and 5.66 CPS at approximately waist height. Three other fixed July measurements averaged 5.19 CPS; route-integrated spectra averaged 4.78-4.96 CPS; and a local low control averaged 3.45 CPS.

The XML accumulations, GPS tracks and time-resolved spectrograms agree closely. Both principal elevations were sustained across their measurement periods rather than being produced by a single transient count spike. The spectra show broad increases in count density and modest changes in spectral hardness, but no securely resolved diagnostic photopeak.

Regulatory position: The data provide a reasonable basis for a formal, calibrated verification and characterisation survey. They do not establish radioactive contamination, radionuclide identity, harmful exposure or attribution to hydrocarbon operations.

Primary comparison	Near-surface CPS	Raised/reference CPS
February elevated verge	9.13	6.35 raised; 4.36 baseline
July access cover	6.09	5.66 raised; 5.19 other fixed mean

1. Purpose and scope

The purpose of this note is to consolidate the available native measurement files into a concise and auditable account for Environment Agency review. It is a screening-data submission rather than a radiological source assessment. Observation, interpretation and inference are kept separate throughout.

The principal question is whether the measurements are sufficiently coherent to justify professional verification. The note does not attempt to determine whether the observed spatial variation arises from ordinary geological background, construction materials, drainage or sediment, instrument geometry, or another environmental source.

2. Data and analytical method

Native format	Information used	Analytical role
XML spectrum	Live time; channel counts; calibration; detector serial	Defined accumulated spectrum and mean CPS
.rctrk	Timestamp; GPS; accuracy; running CPS; field notes	Location, route and stationary/moving context
.rcspg	Timestamped 1,024-channel spectral slices	Chronology, sustained behaviour and spectrum reconstruction
Photographs	Surface setting and detector context	Physical documentation only

All count-rate values in this note are calculated from native channel counts and live time. The final channel in each XML spectrum was treated as an overflow or terminal export bin and excluded from the principal CPS calculations. Including it would not change the qualitative findings.

The July XML files share an implausible common export end time and are not used to establish field chronology. Their measurement intervals were reconstructed from the July spectrogram and matched to the GPS track. Reconstructed spectrogram rates agree with the XML rates to within approximately 0.01 CPS for the principal fixed measurements. February XML times align directly with the February track and spectrogram.

The track CPS field is a running instrument estimate. Individual moving-track records are not independent counts and are not treated as equivalent to fixed accumulations. Dose-rate values are not central to this review because the export display convention and units require confirmation; the analysis therefore focuses on CPS and native spectral channels.

A. February 2026 elevated-verge location **B. July 2026 access-cover location**

Figure 1. Physical context of the two principal elevated measurement locations. These are separate locations and should not be interpreted as a repeated measurement of one point.

3. Fixed-measurement results

Table 1 presents the principal fixed comparisons. The conservative July comparator is the combined mean of three other stationary July exposures (5.19 CPS), rather than relying solely on the unusually low 3.45 CPS control point.

Measurement	Duration	CPS	Mean energy	Comparison
February baseline verge	15 min 17 s	4.36	140.9 keV	Local reference
February elevated point	15 min 11 s	9.13	174.3 keV	2.09 x baseline
February raised comparison	5 min 19 s	6.35	157.2 keV	1.45 x baseline
July local low control	20 min 30 s	3.45	145.4 keV	Local low, not route-wide background
July other fixed mean	32 min 10 s combined	5.19	152.4 keV	Conservative fixed reference
July cover near surface	20 min 25 s	6.09	174.5 keV	1.17 x other fixed mean
July cover raised	10 min 19 s	5.66	159.4 keV	1.09 x other fixed mean

Under a simple independent Poisson-counting model, the February elevated-to-baseline rate ratio is 2.09 (approximate 95% confidence interval 2.01-2.17). The July cover-to-local-low ratio is 1.77 (1.70-1.83), although the 5.19 CPS fixed-measurement mean is the more conservative July reference. Relative to that mean, the near-surface cover measurement is approximately 17% higher and the raised measurement approximately 9% higher.

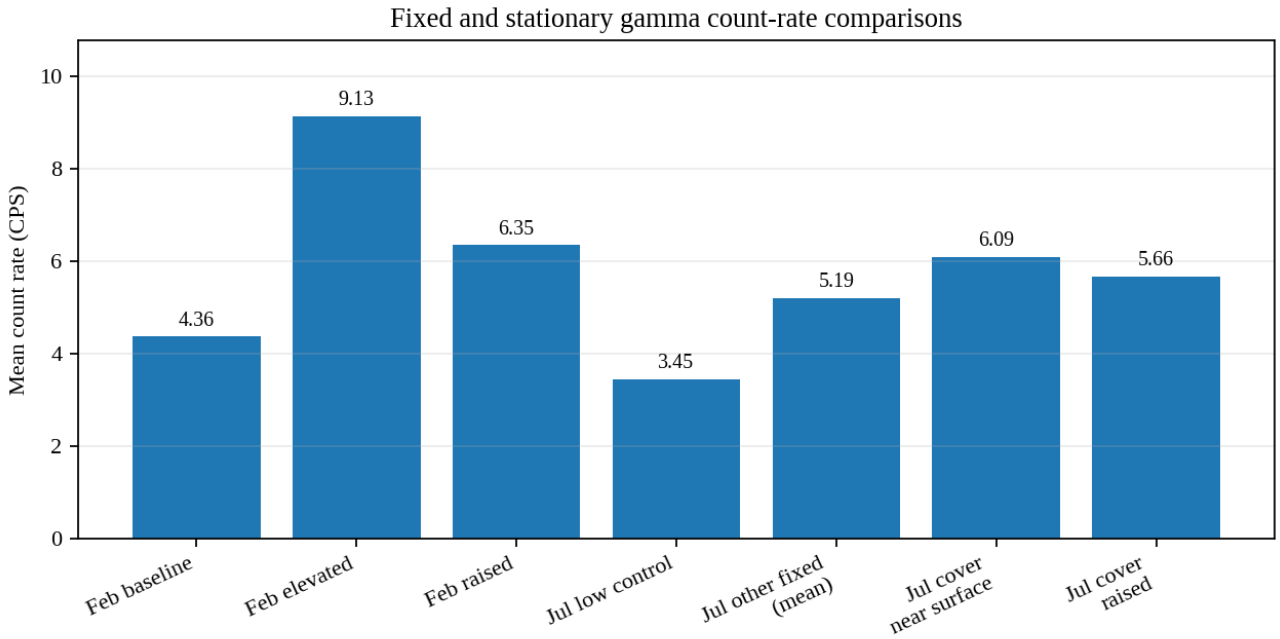

Figure 2. Fixed and stationary count-rate comparisons. The February and July groups relate to different locations and separate survey sessions.

3.1 February 2026 fixed experiment

Observation. The February near-surface measurement remained on a stable elevated plateau for approximately 15 minutes. The raised measurement decreased but remained above the nearby baseline. The baseline accumulation was closely duration-matched to the elevated accumulation, strengthening the internal comparison.

Interpretation. The sequence demonstrates a sustained local and height-related difference during that session. It is not a single electronic spike. The available data do not identify the material or mechanism responsible for the contrast.

Context from other tracks. Moving passes near the February point were elevated on several later or earlier routes, but not on every visit. Because those records are running estimates collected while moving, they are retained as reconnaissance support rather than evidence of a permanent hotspot.

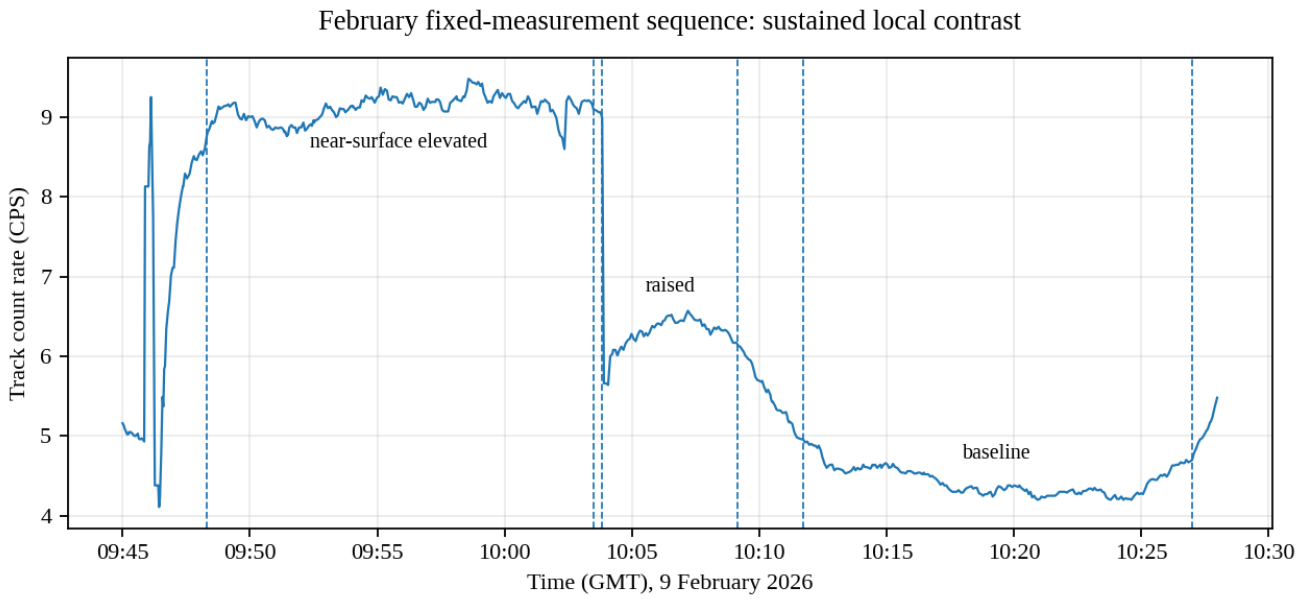

Figure 3. February track count-rate sequence showing the sustained elevated, raised and baseline intervals. Dashed lines mark measurement boundaries.

The February spectrogram independently reconstructs the accumulated spectra at approximately 9.13, 6.35 and 4.37 CPS. The energy distributions are broad and do not provide a secure radionuclide identification.

3.2 July 2026 access-cover experiment

Observation. The near-surface access-cover spectrum averaged 6.09 CPS over approximately 20 minutes. The raised spectrum averaged 5.66 CPS over approximately 10 minutes. The strongest cover result is approximately 22% above the longer route spectrum (4.96 CPS), 27% above the shorter bus-stop-to-bridge walk (4.78 CPS), and 17% above the combined mean of the three other fixed July exposures (5.19 CPS).

The local low control averaged 3.45 CPS. Track data indicate that this was a genuinely lower section of the route, but it should not be used as the sole definition of corridor background. The access-cover elevation is therefore real within the field dataset, but more modest when compared with the other stationary and moving July measurements than when compared only with the local low.

The GPS track contains gaps during the access-cover stop and no records during the raised interval. The continuous spectrogram nevertheless preserves both periods and reproduces the XML count rates and spectral shapes. The elevation was sustained throughout the fixed accumulation rather than being caused by a brief transient.

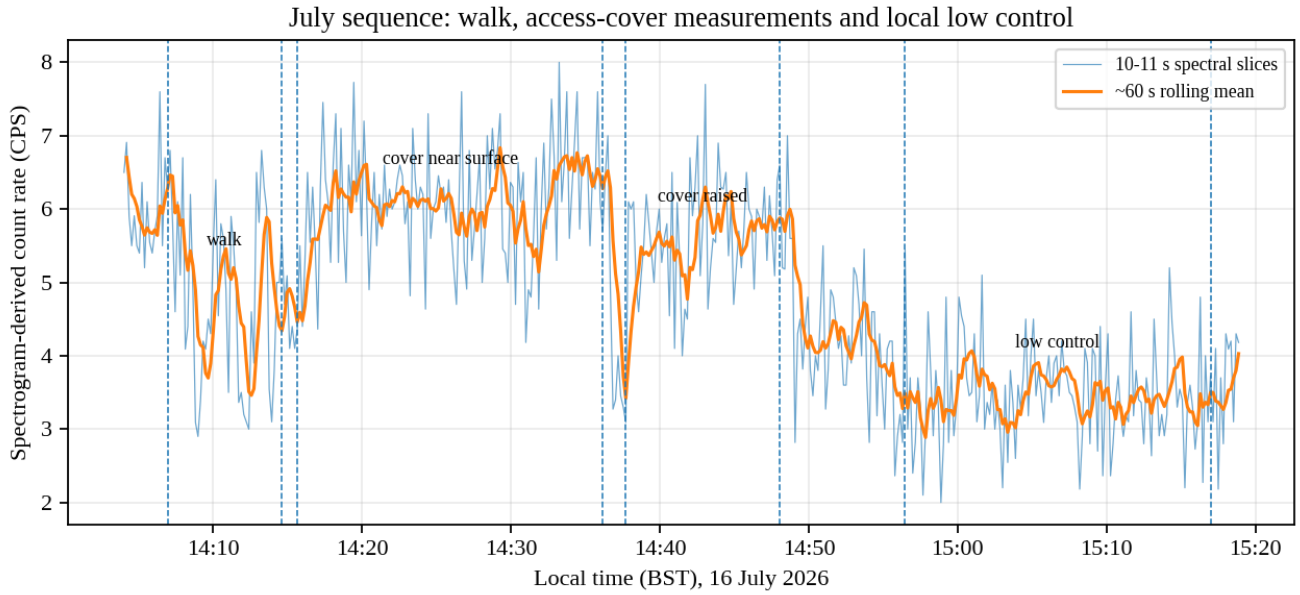

Figure 4. July spectrogram-derived count rate through the walking, near-surface cover, raised cover and local-low-control sequence. Fine values are 10-11 second spectral slices; the heavier line is an approximately 60-second rolling mean.

The red/orange tonal intensification around the cover is a co-located visual observation only. The data do not establish that the colouration is radioactive, deposited material, contamination, or the cause of the elevated count rate.

4. Spatial and multi-date context

The supplied tracks include surveys on 5 January, 8-9 February and 9-10, 15-16 July 2026, plus a May 2025 route-integrated spectrum. Route medians on the principal 2026 tracks range from approximately 4.58 to 5.18 CPS. This demonstrates that the corridor is not represented adequately by one low control point and supports a mapped, standardised professional survey.

Date / route	Median CPS	10th-90th percentile	Role
5 Jan - PNR	4.75	4.36-5.45	Early comparator
8 Feb - PNR walk	4.62	3.70-5.26	Reconnaissance
9 Feb - fixed experiment track	5.32	4.35-9.16	Primary experiment
9 Jul - Anna's Road	5.04	3.54-5.55	Wider-area context
10 Jul - PNR-Westby	4.99	3.00-5.84	Reconnaissance
15 Jul - PNR route	5.18	3.80-6.88	Reconnaissance
16 Jul - fixed survey track	5.14	3.95-5.65	Primary July survey

Several moving passes close to the registered February point and July cover show local rises, while other passes do not. This variability may reflect route direction, detector response time, measurement height, surface conditions or genuine temporal variation. It identifies revisit targets but does not establish persistence.

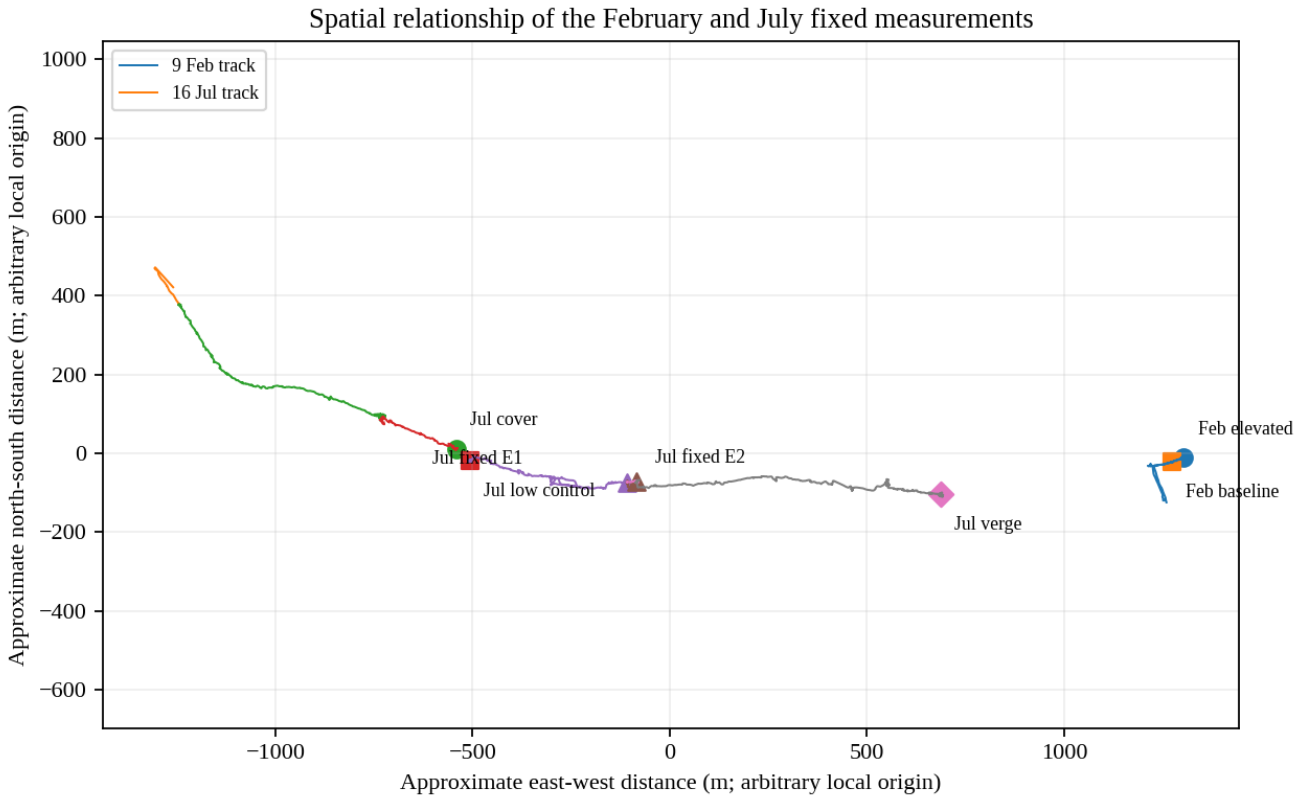

Figure 5. Relative spatial arrangement of the February and July primary tracks and fixed measurement points. Axes are approximate local metres and are intended to show relationships rather than provide a surveyed base map.

5. Interpretation and evidential limits

5.1 What the data support

- Sustained local count-rate differences at two separate roadside locations, measured with the same detector and calibration.
- A reduction at increased detector height in both fixed experiments, stronger in February than in July.
- Close agreement between accumulated XML spectra, GPS track behaviour and time-resolved spectrogram reconstruction.
- A spatially variable corridor in which one low control does not represent all route conditions.
- A proportionate basis for calibrated, regulator-led verification and characterisation.

5.2 What the data do not establish

- The presence, concentration or identity of a particular radionuclide.
- Radioactive contamination or exceedance of a regulatory or health-protection threshold.
- A connection to shale gas operations, groundwater movement, drainage or any other specific mechanism.
- Temporal persistence at one point: the February and July principal measurements concern different locations.

6. Requested Environment Agency action

A proportionate regulatory response would be to refer the native files and this note to an appropriate radiological specialist and undertake, or arrange, a mapped verification survey. The requested work is:

- Repeat measurements with calibrated professional instruments at PNR-FEB-H01, PNR-FEB-C01, PNR-JUL-DC01 and PNR-JUL-C02, together with the three July intermediate fixed points.
- Use defined and repeatable geometries, including close-to-surface and approximately 1 m height measurements of adequate duration.
- Establish several local and wider controls rather than relying on a single low point.
- Record gamma dose rate and professional gamma spectrometry concurrently, with quality-control and calibration information.
- Inspect the access cover, surrounding surface and any drain sediment or residue; undertake sampling and laboratory analysis only if professional field measurements confirm a localised elevation.
- Advise whether the observations fall within expected variation from local geology and construction materials or require further investigation.
- Test areas of residual sediment staining, or white powdery locations in adjoining fields for Radionuclides. The author can identify several areas of interest.

7. Conclusion

The available citizen measurements do not answer the source question, but they are sufficiently coherent to justify a formal verification survey. The strongest basis is not any single maximum value. It is the convergence of sustained fixed accumulations, height comparisons, spatial controls, GPS tracks and time-resolved spectra. A calibrated professional survey is the appropriate next evidential step.

Appendix A - Spectral comparison and native-data inventory

Figure A1 shows the principal accumulated spectra rebinned to 20 keV intervals. The elevated spectra contain greater count density and a somewhat stronger higher-energy tail, but the broad shapes do not display a securely resolved diagnostic photopeak. The figure is descriptive and should not be used for radionuclide identification.

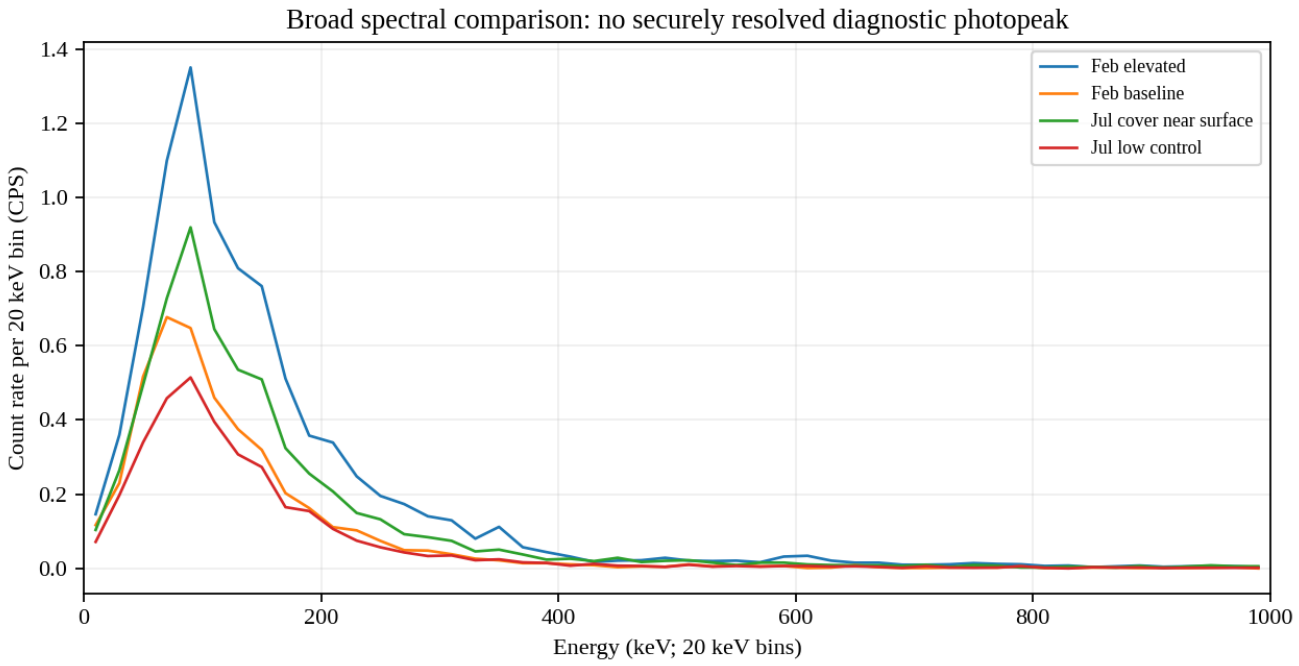

Figure A1. Broad spectral comparison of the February elevated and baseline spectra and the July cover and local-low spectra.

A.1 Principal native files

Dataset	Primary files
February fixed spectra	Hotapot pnr weslies.xml; Weaslues uppy comp.xml; Weaslies baseline verge.xml; PNR TEST 1.xml
February chronology/location	2026-02-09 09-30-17.rctrk; Weaslies tests.rcspg
July fixed spectra	Water mains.xml; Water mains air.xml; Pnr control.xml; Pnr ex2.xml; Pn rex3.xml; Pnr verg exp.xml
July moving spectra	Pnr walk 1.xml; Bus stop to peel hill bridge.xml
July chronology/location	PNR SURVEY JLY16.rctrk; 2026-07-16 13-22-50.rcspg
Additional tracks	2026-01-05 08-45-17.rctrk; 2026-02-08 08-59-04.rctrk; Annas Road walk.rctrk; PNR Westby walk.rctrk; PNR WALK MHL Sock.rctrk
Duplicate/subset note	Pnr stick walk 1.rcspg is a shorter subset of the longer July spectrogram and is not independent corroboration.

A separate master measurement register accompanies this note. It records measurement identifiers, coordinates, durations, native-file relationships, reconstructed times, track summaries and outstanding field-description checks.

Appendix B - Photographic record of July 2026 measurement arrangements

The available photographs document the physical settings and detector arrangements used for the July access-cover, raised-detector and local-low-control measurements. They supplement the native XML spectra, GPS count-rate track and time-resolved spectrogram described in the main note.

A. Near-surface access-cover measurement

B. Raised-detector comparison

C. Separate local-low control

Plate B1. July 2026 measurement arrangements. (A) Near-surface measurement beside the small square access cover within the locally red/orange-toned pavement area. (B) Raised-detector comparison using the same wooden staff; the exact height was not recorded with a scale and is therefore approximate. (C) Near-surface control measurement at the separate local-low location beside a larger rectangular utility access cover. The photographs document measurement geometry and physical context; numerical results are derived from the associated XML spectra, GPS count-rate track and time-resolved spectrogram.